

Claims:

1. A method for making a carbon nanotube-based field emission device comprising steps of:

providing a substrate having a surface;

depositing a catalyst layer on a selected area on the surface of the substrate;

forming a carbon nanotube array extending from the selected area;

forming a cathode electrode on the top of the carbon nanotube array; and

removing the substrate so as to expose the carbon nanotube array.
2. The method as described in claim 1, wherein a variation in flatness of the surface of the substrate is less than 1 micron.
3. The method as described in claim 1, wherein the substrate is made of heatproof glass, silicon, or silicon oxide.
4. The method as described in claim 1, wherein a thickness of the substrate is in the range from 1 micron to 1000 microns.
5. The method as described in claim 4, wherein the thickness of the substrate is in the range from 10 microns to 200 microns.
6. The method as described in claim 1, wherein a thickness of the catalyst layer is

in the range from 1 nanometer to 10 nanometers.

7. The method as described in claim 1, wherein the substrate is removed by etching process.

8. A method for making a carbon nanotube-based field emission device comprising steps of:

providing a substrate having a surface which has a variation in flatness of less than 1 micron;

forming a carbon nanotube array extending from a selected area of the surface of the substrate;

forming a cathode electrode on the top of the carbon nanotube array; and

removing the substrate so as to expose the carbon nanotube array.

9. The method as described in claim 8, wherein the carbon nanotube array is formed by a chemical vapor deposition process.

10. The method as described in claim 8, wherein the carbon nanotube array is treated by laser irradiation to clean the surface thereof.

11. The method as described in claim 8, wherein the substrate is made of heatproof glass, silicon, or silicon oxide.

12. The method as described in claim 8, wherein further forming a gate electrode adjacent to the carbon nanotube array.
13. A method for making a carbon nanotube-based field emission device comprising steps of:
- providing a insulative substrate having a surface;
- forming a carbon nanotube array extending from a selected area of the surface;
- depositing a layer of metallic material on the top of the carbon nanotube array;
- and
- removing the insulative substrate.
14. The method as described in claim 13, wherein the surface of the insulative substrate has a variation in flatness less than 1 micron.
15. The method as described in claim 13, wherein the insulative substrate is made of heatproof glass, silicon, or silicon oxide.
16. The method as described in claim 13, wherein said surface is polished with great flatness.